We can use the inverse trig functions on a calculator to solve for the angles that give a particular trig function value. In other words, given a specific value \( v \), we can find the angles \( \theta \) such that

\[
\sin \theta = v \quad \text{or} \quad \cos \theta = v \quad \text{or} \quad \tan \theta = v
\]

We always take the angles to be between 0º and 360º, and in each case, there will be two solutions. However, the calculator will only give one angle, so we will need to find the appropriate symmetric angles in the correct quadrants to give the solutions.

**Example.** To the nearest 100th, find the angles between 0º and 360º such that

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<thead>
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<tbody>
<tr>
<td>(a) ( \sin \theta = 0.850444 )</td>
<td>(c) ( \cos \theta = 0.91706 )</td>
<td>(e) ( \tan \theta = 0.18101 )</td>
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<tr>
<td>(b) ( \sin \theta = -0.916921 )</td>
<td>(d) ( \cos \theta = -0.78801 )</td>
<td>(f) ( \tan \theta = -1.5 )</td>
</tr>
</tbody>
</table>

**Solution.** (a) There are two angles where \( \sin \theta = +0.850444 \), one in the 1st Quadrant and one in the 2nd Quadrant.

The command \( \sin^{-1}(0.850444) \) gives \( \theta = 58.26^\circ \).

The corresponding angle in the 2nd Quadrant is \( 180^\circ - 58.26^\circ = 121.74^\circ \).

(b) There are two angles where \( \sin \theta = -0.916921 \), one in the 3rd Quadrant and one in the 4th Quadrant. Initially, we can ignore the “negative” to find the reference angle in the 1st Quadrant: \( \sin^{-1}(0.916921) \) gives \( \theta = 66.48^\circ \).

The corresponding angles in the 3rd and 4th Quadrants are \( 180^\circ + 66.48^\circ = 246.48^\circ \) and \( 360^\circ - 66.48^\circ = 293.52^\circ \).

Thus, the solutions are \( 246.48^\circ \) and \( 293.52^\circ \).
(c) There are two angles where \( \cos \theta = +0.91706 \), one in the 1st Quadrant and one in the 4th Quadrant.

The command \( \cos^{-1}(0.91706) \) gives \( \theta = 23.5^\circ \). The corresponding angle in the 4th Quadrant is \( 360^\circ - 23.5^\circ = 336.5^\circ \).

Thus, the solutions are \( 23.5^\circ \) and \( 336.5^\circ \).

(d) There are two angles where \( \cos \theta = -0.78801 \), one in the 2nd Quadrant and one in the 3rd Quadrant. Initially, we ignore the “negative” to find the reference angle in the 1st Quadrant: \( \cos^{-1}(0.78801) \) gives \( \theta = 38^\circ \).

The corresponding angles in the 2nd and 3rd Quadrants are \( 180^\circ \pm 38^\circ \), which give \( 142^\circ \) and \( 218^\circ \).

Thus, the solutions are \( 142^\circ \) and \( 218^\circ \).

(e) There are two angles where \( \tan \theta = +0.18101 \), one in the 1st Quadrant and one in the 3rd Quadrant.

The command \( \tan^{-1}(0.18101) \) gives \( \theta = 10.26^\circ \).

The corresponding angle in the 3rd Quadrant is \( 180^\circ + 10.26^\circ = 190.26^\circ \).

(f) There are two angles where \( \tan \theta = -1.5 \), one in the 2nd Quadrant and one in the 4th Quadrant.

The command \( \tan^{-1}(1.5) \) gives \( \theta = 56.31^\circ \).

The corresponding angles in the 2nd Quadrant and 4th Quadrants are \( 180^\circ - 56.31^\circ = 123.69^\circ \) and \( 360^\circ - 56.31^\circ = 303.69^\circ \).

Thus, the solutions are \( 123.69^\circ \) and \( 303.69^\circ \).